



*High resolution, book format.*

Deconstruction

Jules Jürgensen

Five minute repeater  
with foudroyante chronograph  
(1890)

by

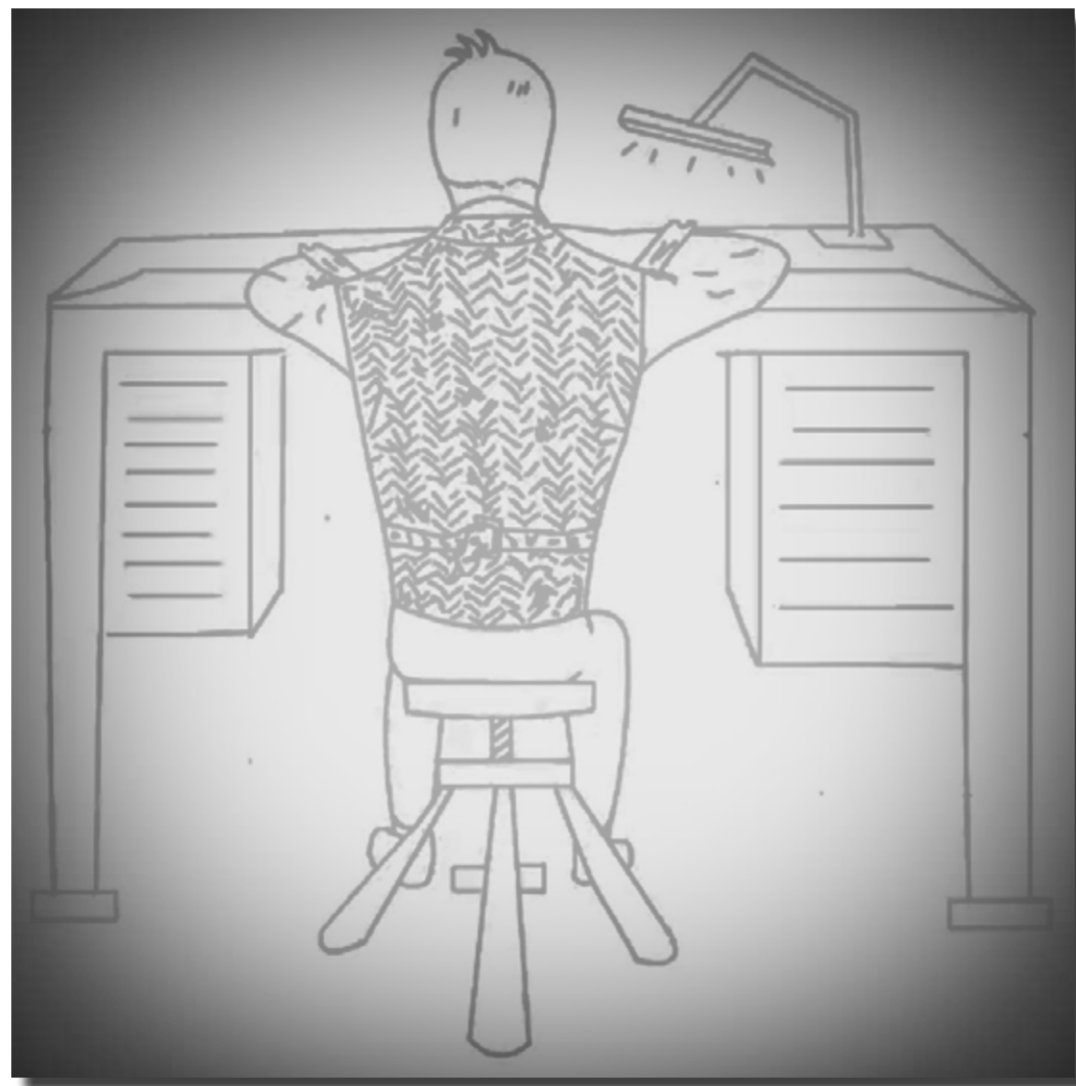
# THE NAKED WATCHMAKER

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P. P. P.  
Sørensens  
Copenhagen

PATENT 1867 JANUARY 15

## Jules Jürgensen

Jules Jurgensen, born in Locle, Switzerland in 1808 while his parents were visiting and his father was studying jewel making. The family was based in Copenhagen where his father Urban made timepieces and thermometers. Jules grew up in Copenhagen working at the bench with his brother, Louis-Urban under his father's guidance. Jules was the third generation of his family to study watchmaking.

The Jurgensen house established by his grandfather Jorgen, apprenticed to a clockmaker in Copenhagen. Jorgen advanced his education in Locle with the renowned horologist, J. F. Houriet with him he set up a business association. Jorgen's son Urban studied the profession with his father and after which he went to Locle, Paris and London to finish his education. He later married Sophie-Henriette Houriet, daughter of J. F. Houriet while in Locle.

Jules followed his father's route and

studied in Locle, Geneva, London and Paris. Approximately in 1835 he started making watches in Locle. He married a Swiss woman, Anastasie Lavalette who was from a watchmaking family based in Geneva in 1836. She bore five children two sons and three girls, Jules-Urban-Frederick and Jacques-Alfred who also became watchmakers. This part of the family added to their watches "Copenhagen" for many years, even though they were made in Switzerland.

The business remained under family ownership till 1916 when David Golay a watchmaker from the company purchased it from Jacques-Alfred's widow. He then sold it to E. Heuer in Bienne in 1925.

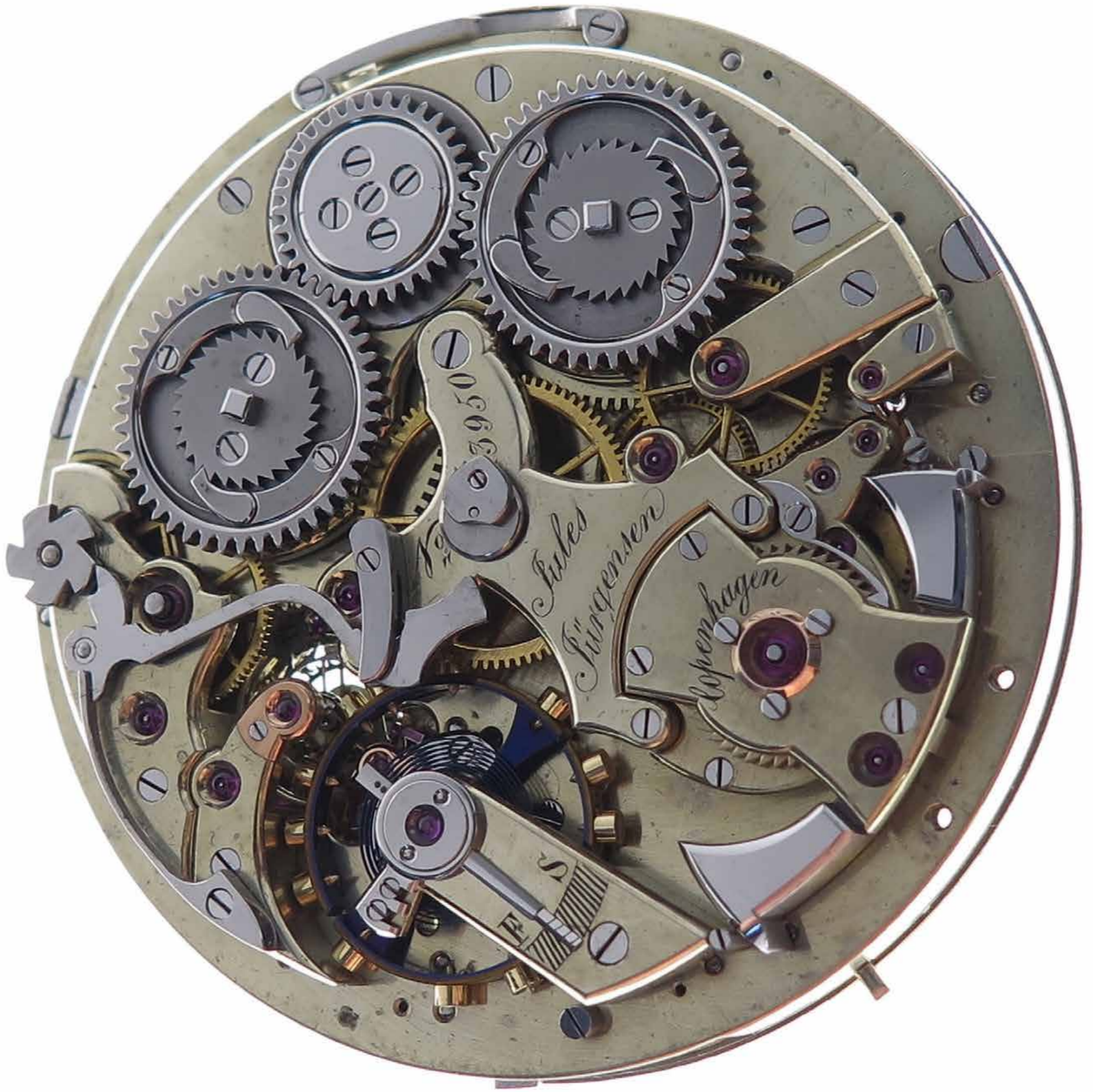
By 1936, with the depression, desire for exceptional time-pieces reduced to virtually nothing and the company was sold to the New York house of Aisenstein-Woronock. The watches continued to be produced in Switzerland until 1957.

In addition to being generally heavily over-engineered horology, the system of setting is unique to Jurgensen. It is five minute repeater with single push piece chronograph. The chronograph records up to 1 minute and the offset seconds has 5 incremental jumps in a single second (foudroyante). There are two trains in the movement and the watch is wound by winding the crown in both directions, winding both barrels. One for the going train, one for the chronograph/foudroyante. Another aspect of this watch which makes it unusual is the setting of the hour executed by tilting the bow towards the dial, then the crown adjusts the time instead of winding the mainsprings.





Five minute repeaters were first made in 1710 by Samuel Watson, the repeater strikes the hours on one gong and then the number of five-minute periods after the hour on the second gong. The mechanism uses a low tone for the hours and a higher tone for the minutes.



A "foudroyante" hand, has a cycle of one second. Watches equipped with such a hand typically also feature a conventional seconds hand. The foudroyante hand can be central or in a sub-dial, and can be used for timekeeping or as part of a chronograph.





The underside of the movement with the dial removed. The repeater mechanism is shown to the left of centre. Setting to the right and the foundroyante at the bottom. The chronograpgh mecanism is shared between both sides of the movement.



The time and chronograph hands. All made in steel and then blued. Extremely fine and delicate and synonymous to the DNA of Jurgensen.



The enamel two piece dial that clips onto the movement and is locked by 2 laterally placed screws through the skirt.



The black enamel details were added to the white enamel at a lower temperature to avoid the two colours running into each other during firing.



The repeater hammers made in hardened steel, angled and flat polished.



The oversized hour wheel. Larger in diameter than on the majority of movement constructions.



### Balance and balance cock

The steel of the bi-metallic balance wheel (designed to compensate for variations in time caused by heat), has been left blue, an unusual aesthetic for the majority of split balances.



The five minute repeater mechanism. All levers, racks and springs made in hardened steel and were hand finished.



The Swiss lever cock is made in hardened steel and mirror finished.

The cock is made in hardened steel and mirror finished. The end shake of the anchor it holds in place is controlled by an end piece with cap jewel set into a gold plate, in turn held in place with a screw.



The centre 5 minute cam that control the distance the 5 minute rack drops inturn dictating the number of 5 minute intervals stuck on thr minute gong.



The lower, hour rack, closest to the mainplate, the pinion above it is meshed by the operating lever

which is manually activated by the user through the outer slider. The hook on the highest level drives the 5 minute rack.



The escape wheel in place with the lever cock and balance removed.



The double layered escape wheel. The lower section below the escape wheel controls the jumping strokes of the off set seconds which pulses 5 times during each second.



The stud holding the balance spring; the direction of the screws, perpendicular to the centre rather than concentric, is unusual.



The upper repeater barrel arbour jewel. The jewel is rubbed into a gold chaton (bushing) and pushed into the German silver bridge then secured by 3 screws.

A small dot crossing the bridge and the gold chaton facilitates the correct positioning of the chaton in the bridge when it is assembled.





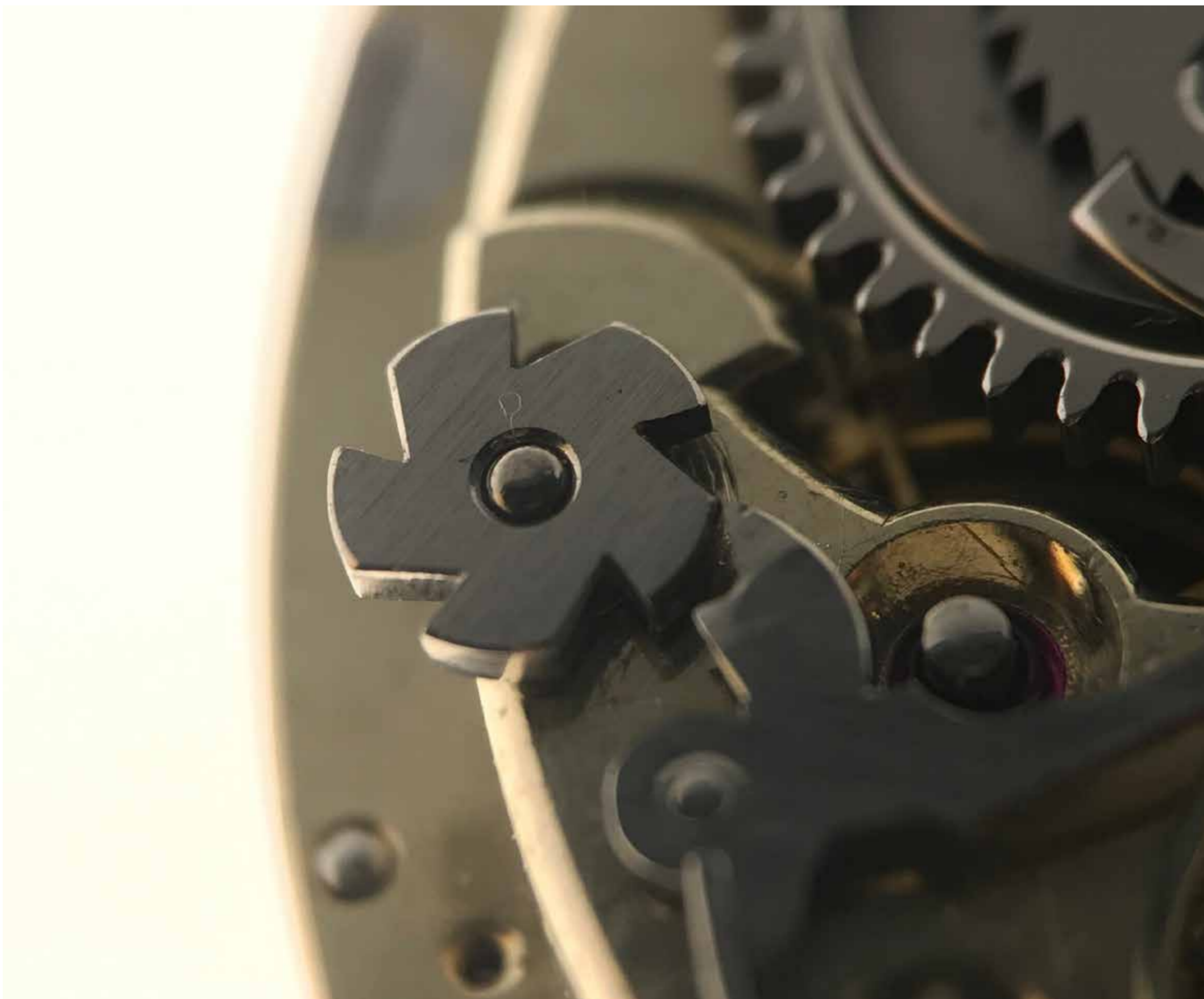
**The heart shaped cam is fixed to the axle which holds the chronograph seconds hand.**

When the hammer below is activated and slides into the cam the heart is returned to a fixed position and the seconds hand will be pointing to 12 o'clock returning to zero.



The heart shaped cam is fixed to the axle which holds the chronograph seconds hand

When the hammer below is activated and slides into the cam, the heart is returned to a fixed position and the seconds hand will be pointing to 12 o'clock.



The selection cam for the chronograph, (on/off/return to zero)



A gold end-piece for the escapewheel pinion limiting the vertical play and pivot friction, as with a balance wheel pivot.



A single roller, housing the impulse jewel made from hardened and polished steel doubling as the safety roller.



The Swiss lever with counterpoise weight. The cut out in the circle allows the escape wheel axle to pass through during assembly. There is no adjustment possible in the pallet jewels.



**The hour rack sitting closest to the mainplate surface,** below this on the other side of the mainplate is the repeater mainspring which is wound as the slider is activated manually on the outside of the case.



Sitting closer to the edge of the mainplate is a large steel leg shaped piece which adjusts the distance between the hammer and the gong through the conical ended screw end, seen at its lower edge.



The centre wheel is below the cam and centre bridge, turning once per hour meshing directly with the barrel.



All engraving executed was made by hand.



The small snail on top of the hour rack drives the 5 minute rack shown below.



The 5 minute rack. The rack which trips the second hammer to sound the passing 5 minutes intervals.



The five minute jumper trip in the centre of the image is pushed by the 5 min rack to lift the hammer.

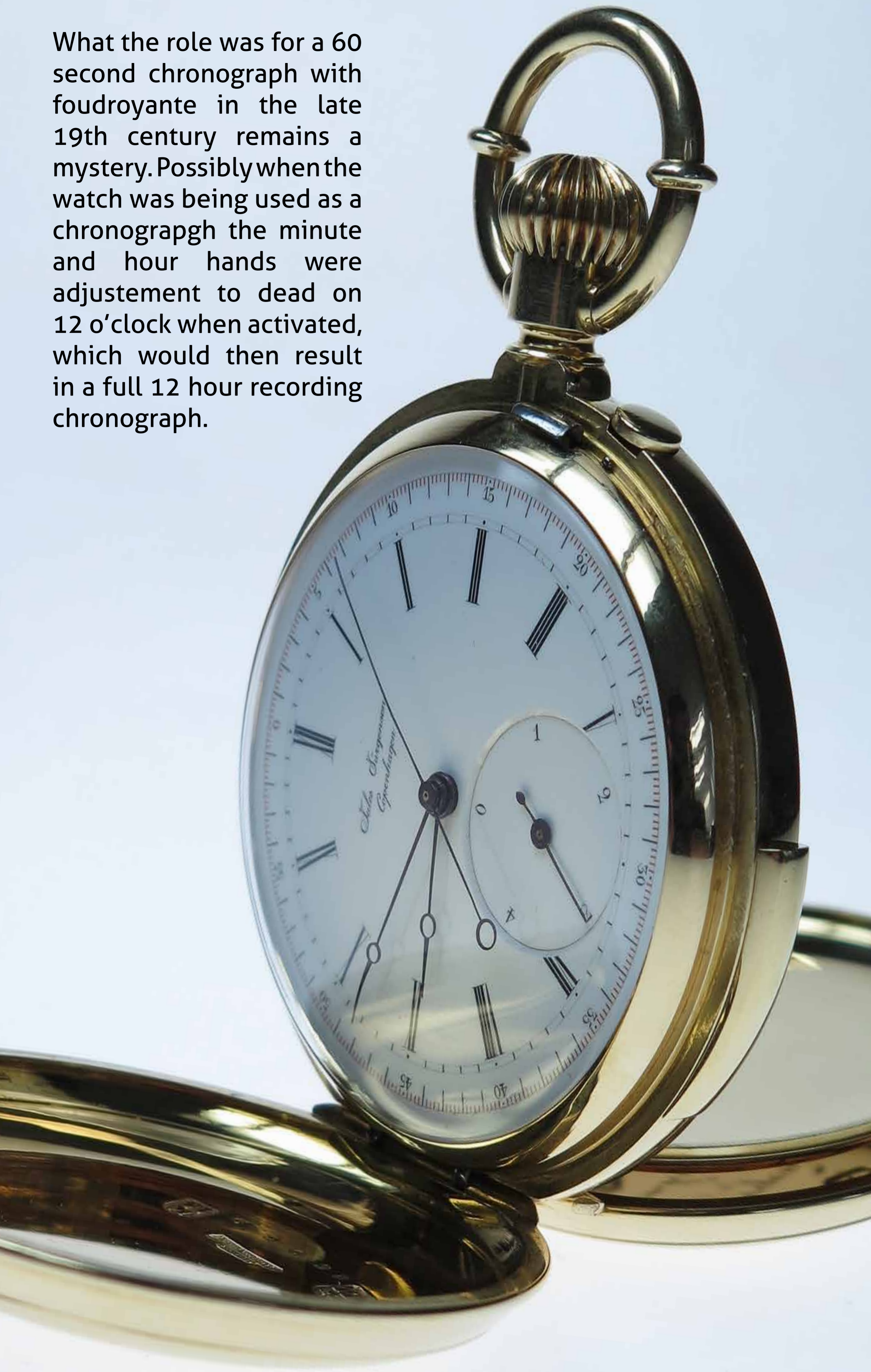
The 2 images below show how the setting mechanism works. On the top the bow leans forward pushing the 'T' shaped pin down, this then pushes the steel bar on the outer side of the mainplate on the lower side image, in-turn pushing down the return bar and sliding pinion into setting position.



On the inside of the bow, as it enters the tube is a semi-circular cam that pushes against the 'T' shaped pin when it leans forward.



What the role was for a 60 second chronograph with foudroyante in the late 19th century remains a mystery. Possibly when the watch was being used as a chronograph the minute and hour hands were adjustment to dead on 12 o'clock when activated, which would then result in a full 12 hour recording chronograph.



Jules Jurgensen's patent for setting the hands was made in 1867. Moving the bow forward (hunting case) or backward (open face) is recognisable by the guard rings on the bow so the clutch wouldn't engage unless the front or back of the case was open.







**Steel is to watchmakers what clay is to potters  
and paint is to artists.**



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